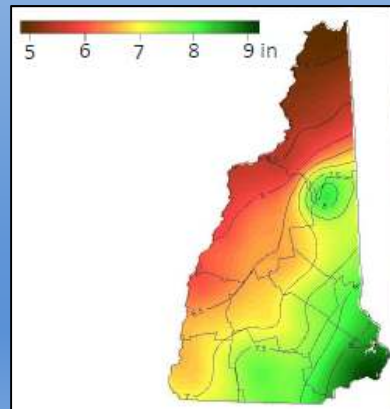


Climate Change in New Hampshire: Planning for the Next Storm



Tom Burack, Commissioner
NH Department of Environmental Services

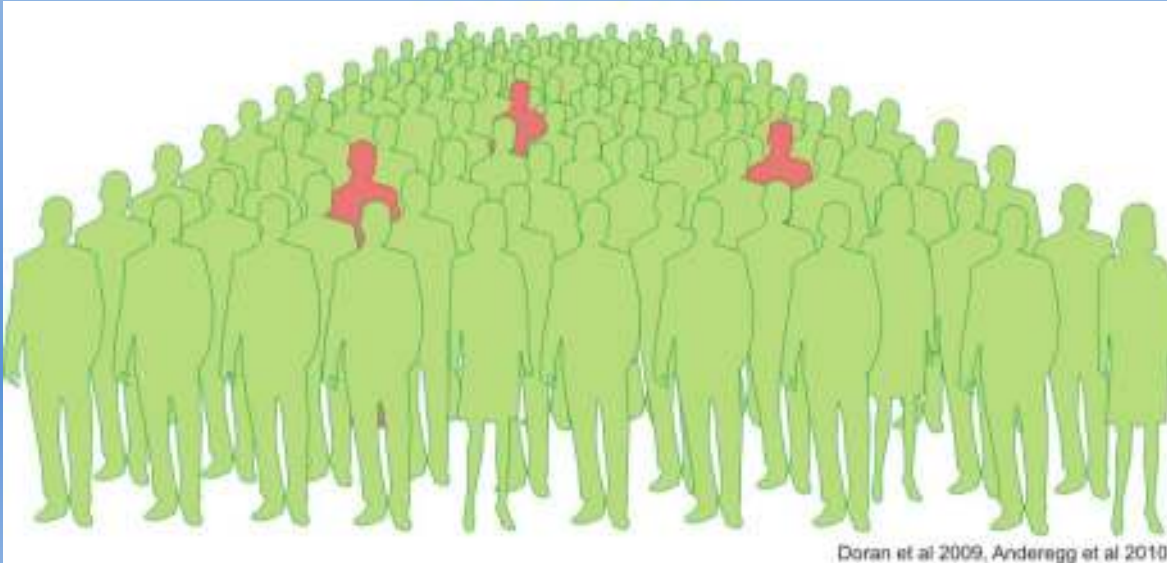
September 18, 2015

The Climate is Not the Weather



- Weather – the set of conditions at any given point in time
- Climate - the average set of conditions over a period of decades.

Climate Change is Real



97% of climate scientists agree that climate-warming trends are likely due to human activity.

Climate Change is Already Occurring



“Climate change, once considered an issue for a distant future, has moved firmly into the present”

Climate Change is of Strategic Importance



“As greenhouse gas emissions increase, sea levels are rising, average global temperatures are increasing, and severe weather patterns are accelerating. These changes, coupled with other global dynamics [will] devastate homes, land, and infrastructure.”

We Have a Choice

- Do nothing – continue business as usual



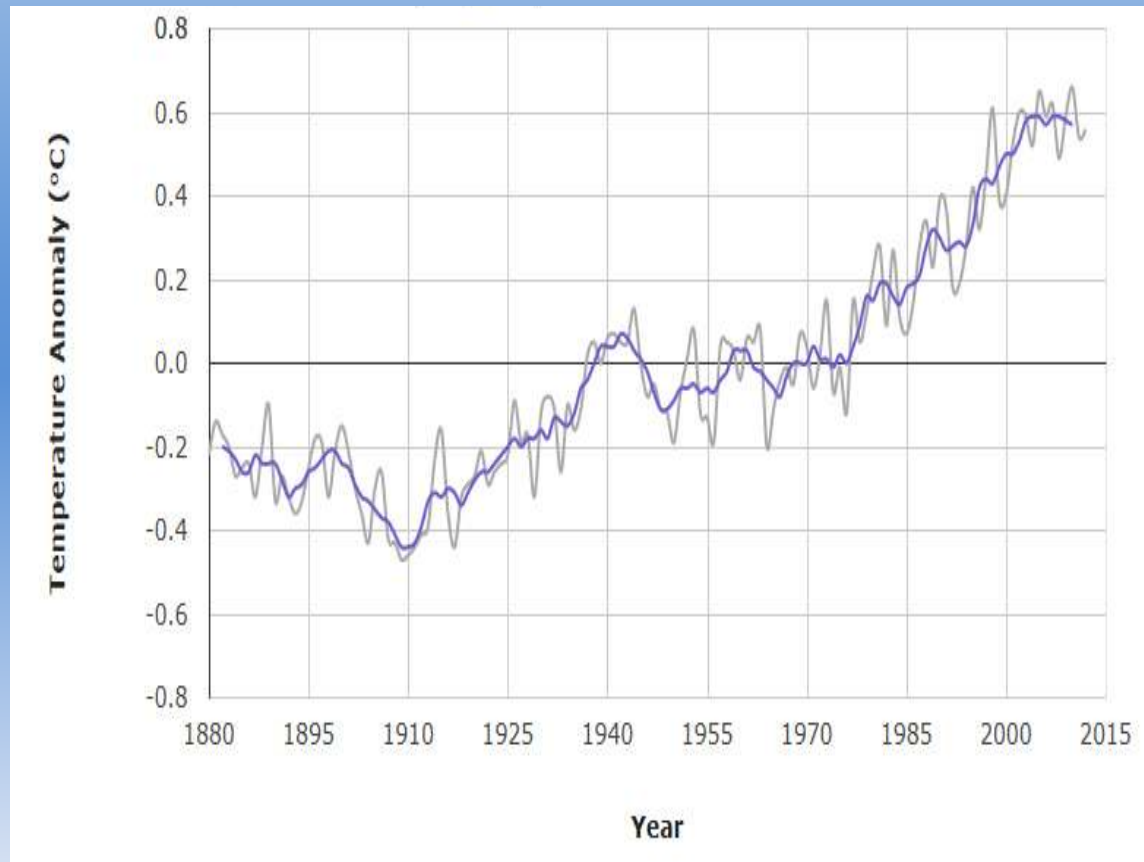
We Have a Choice

- Mitigation
 - Reduce emissions of CO₂ & greenhouse gases
- Adaptation
 - Prepare for the current and future impacts



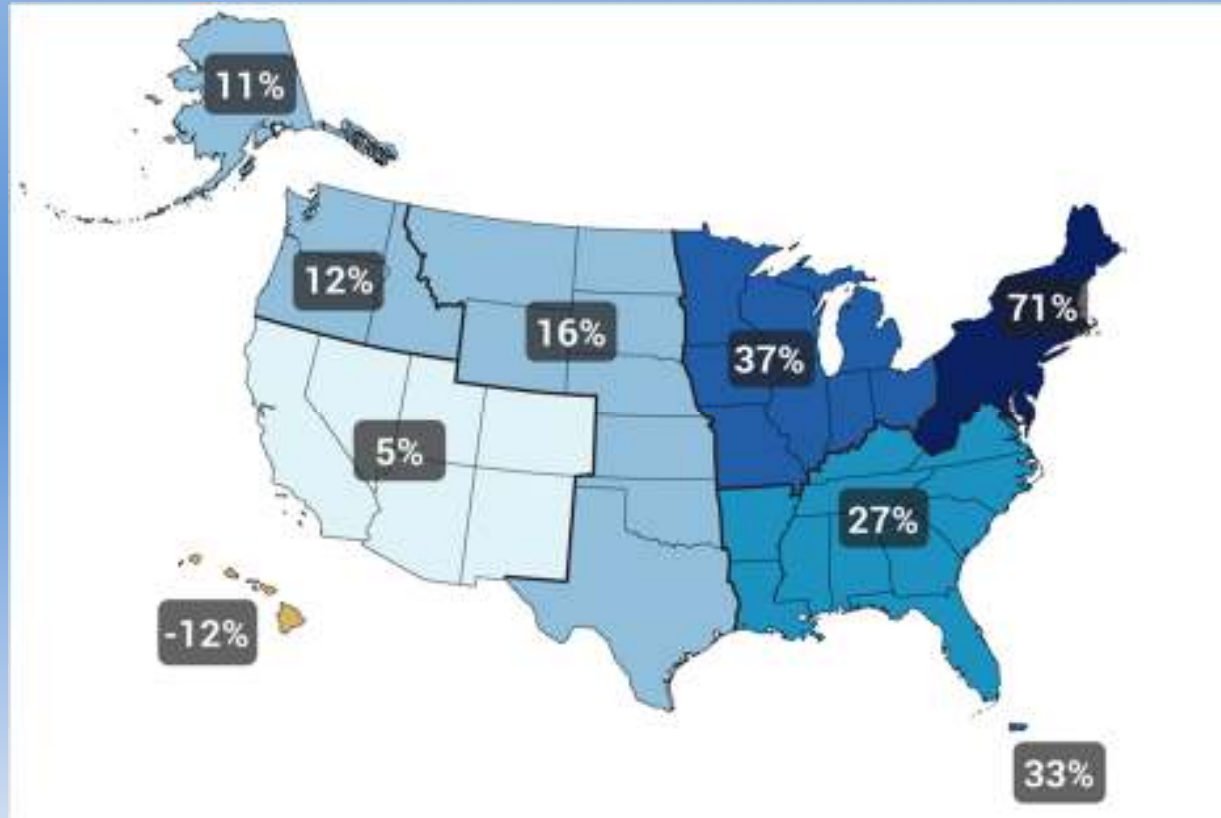
NH's Observed Climate Patterns

- Increase in average temperature
 - Annual & seasonal



NH's Observed Climate Patterns

- Increase in precipitation
 - Amounts and intensity



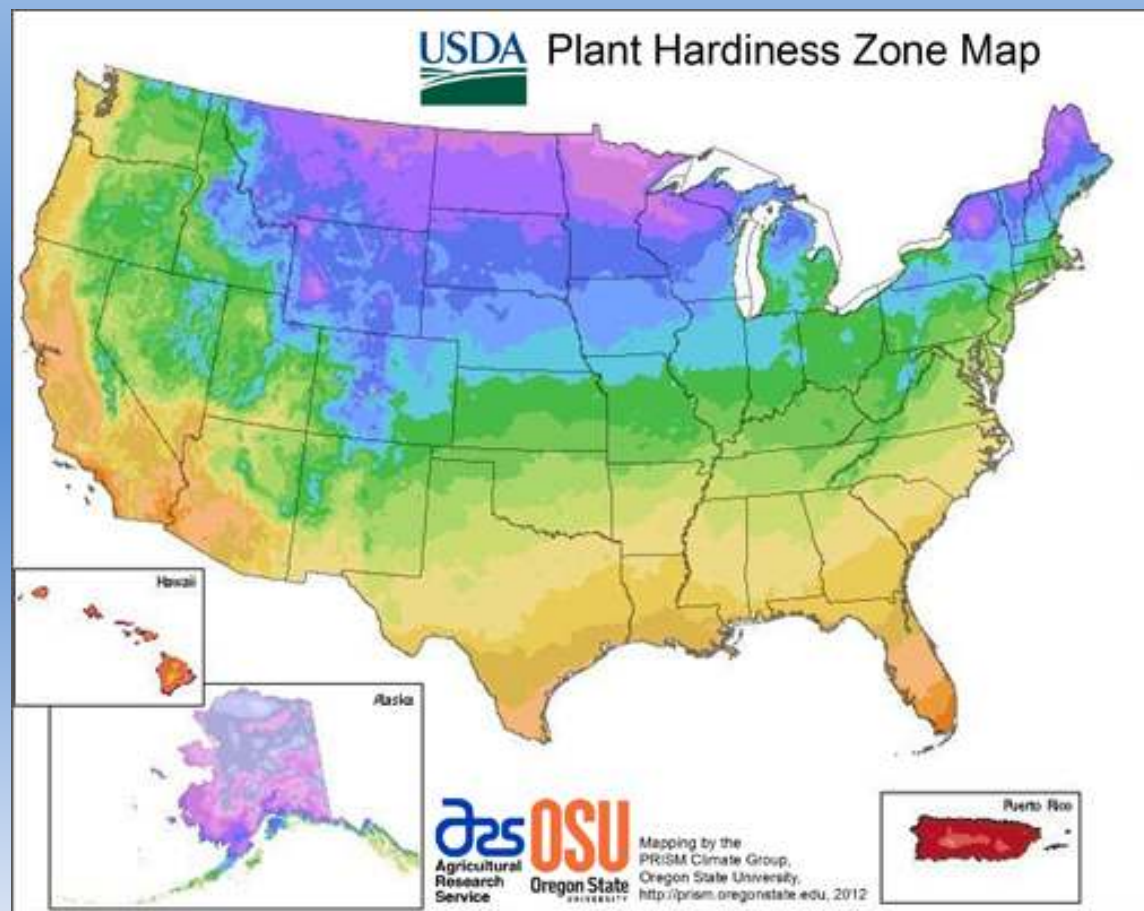
NH's Observed Climate Patterns

- Increase in extreme weather



NH's Observed Climate Patterns

- Changing seasonality



NH's Observed Climate Patterns

- Summer drought



NH's Observed Climate Patterns

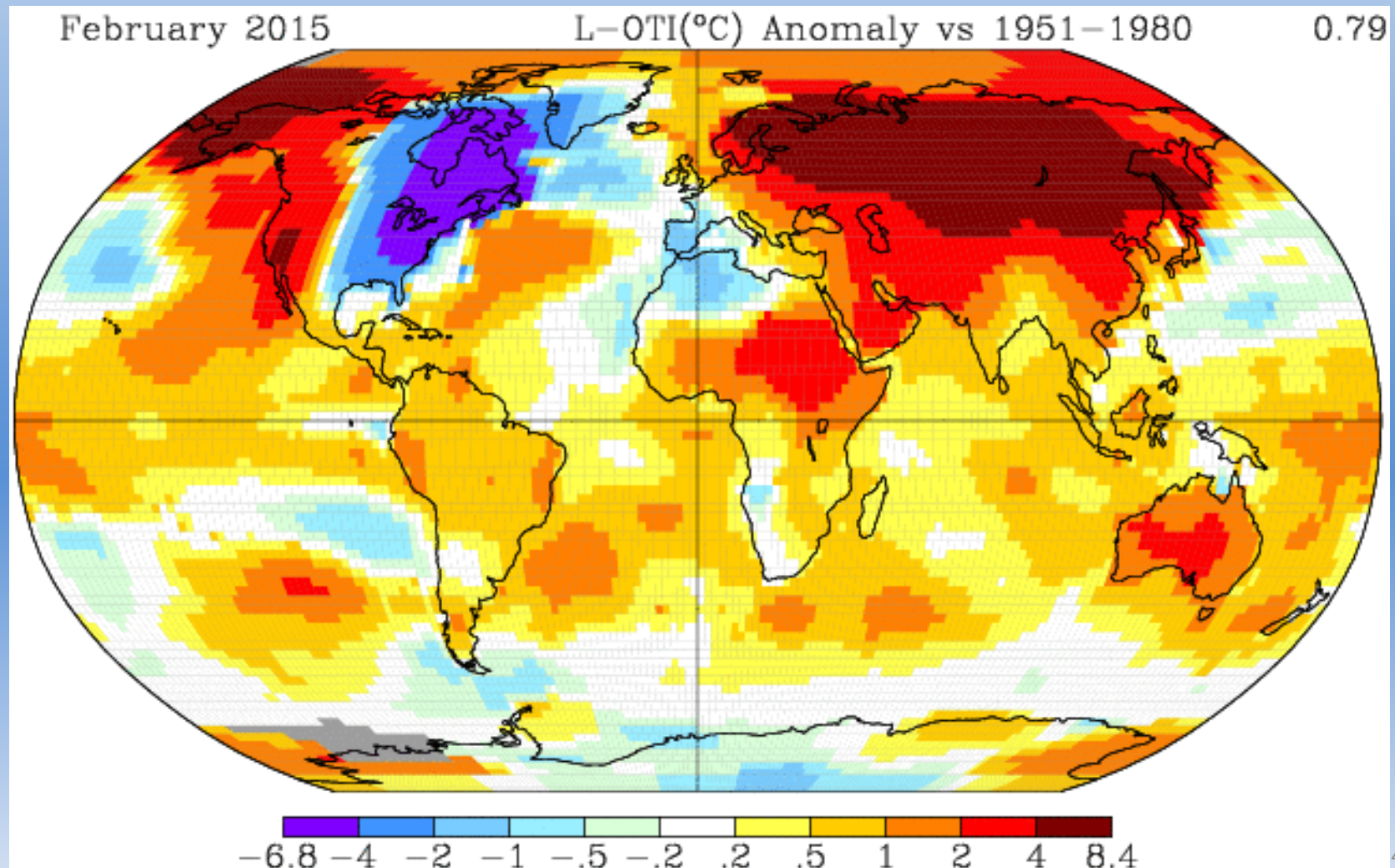
- Sea-level rise



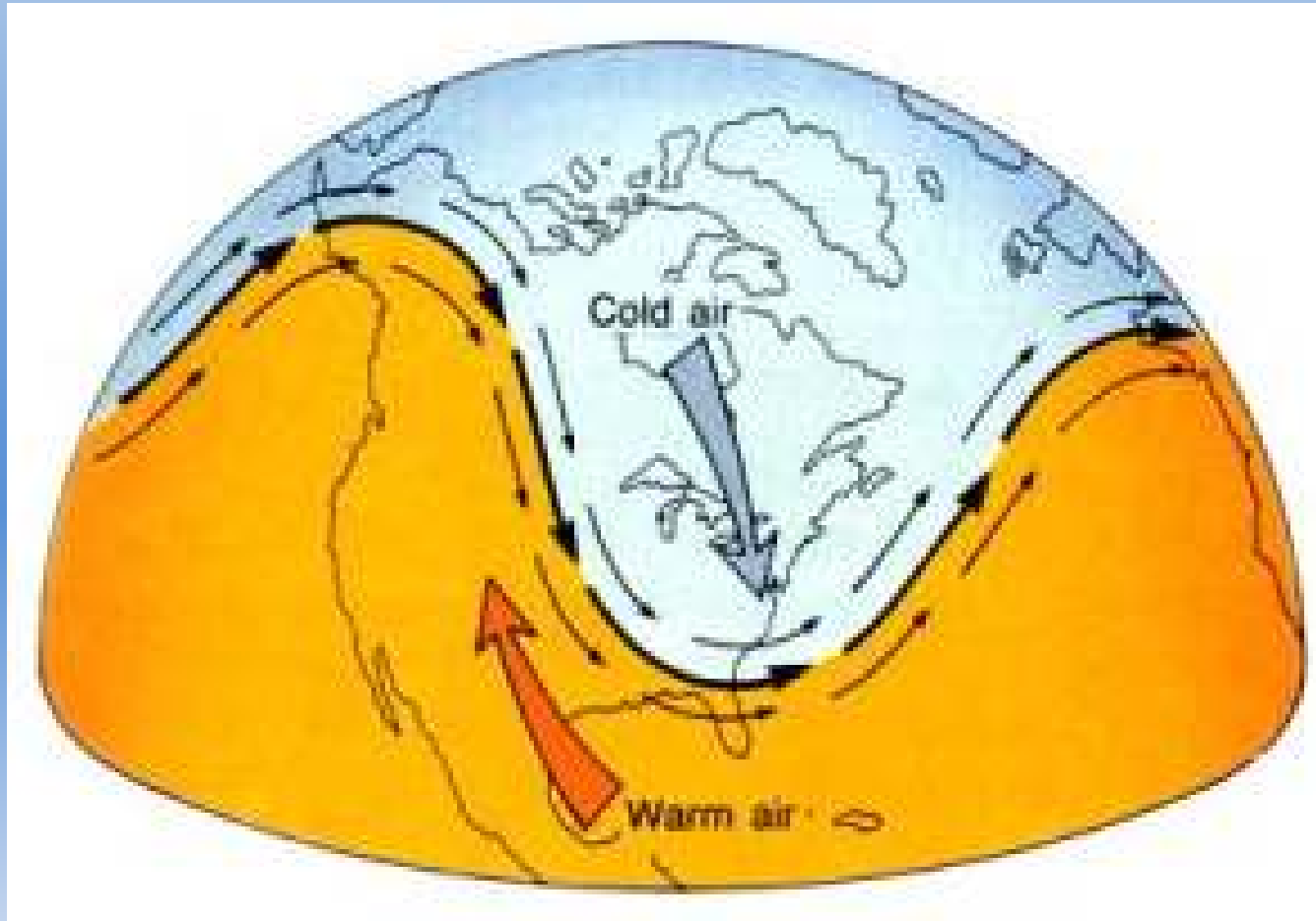
Portsmouth, NH – King Tide Event

Changing Weather vs. Changing Climate

February 2015

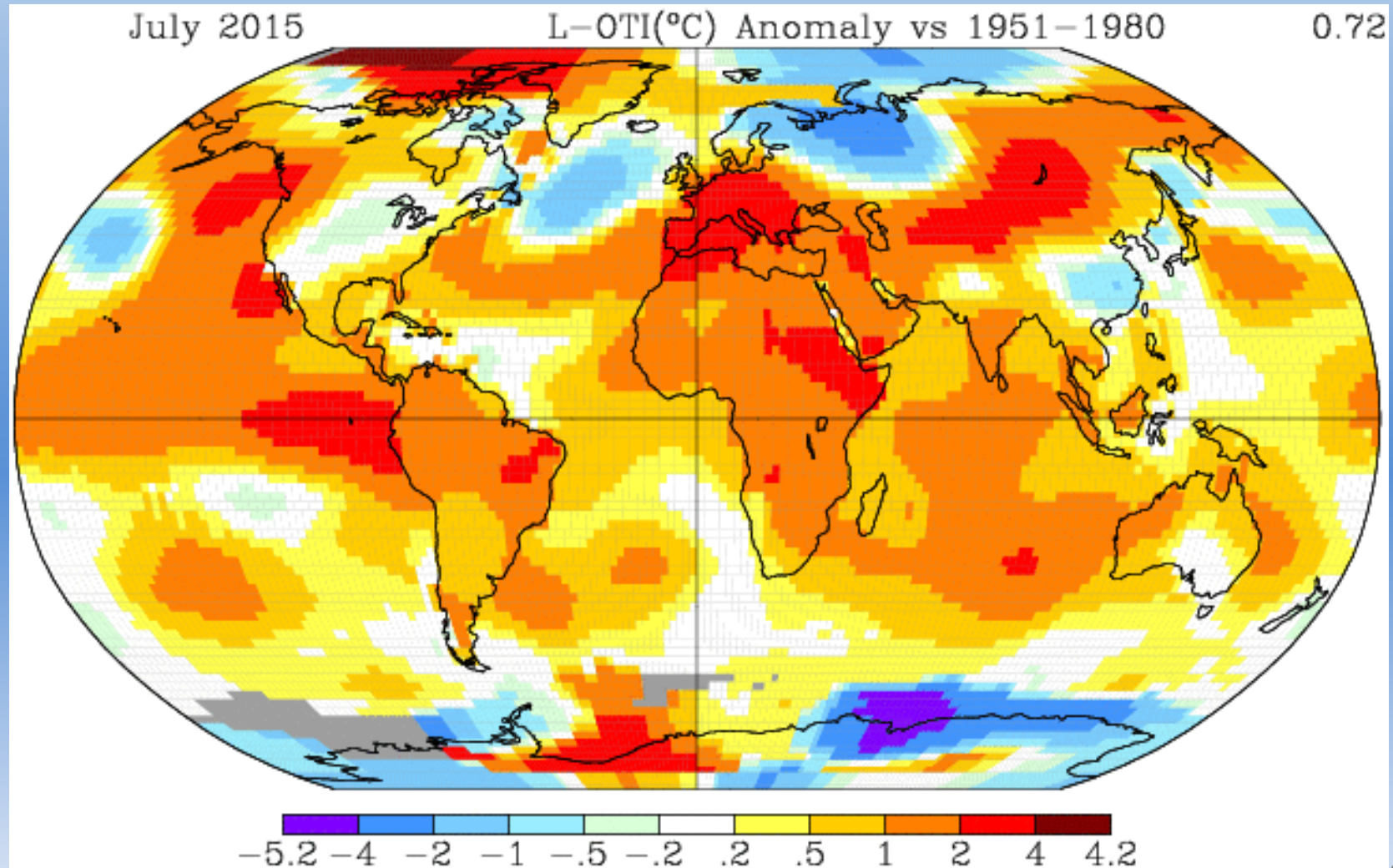


Changing Weather vs. Changing Climate



Land and Ocean Temps Rising

July 2015



Source: NASA - GISS global surface temperature anomaly map for July 2015

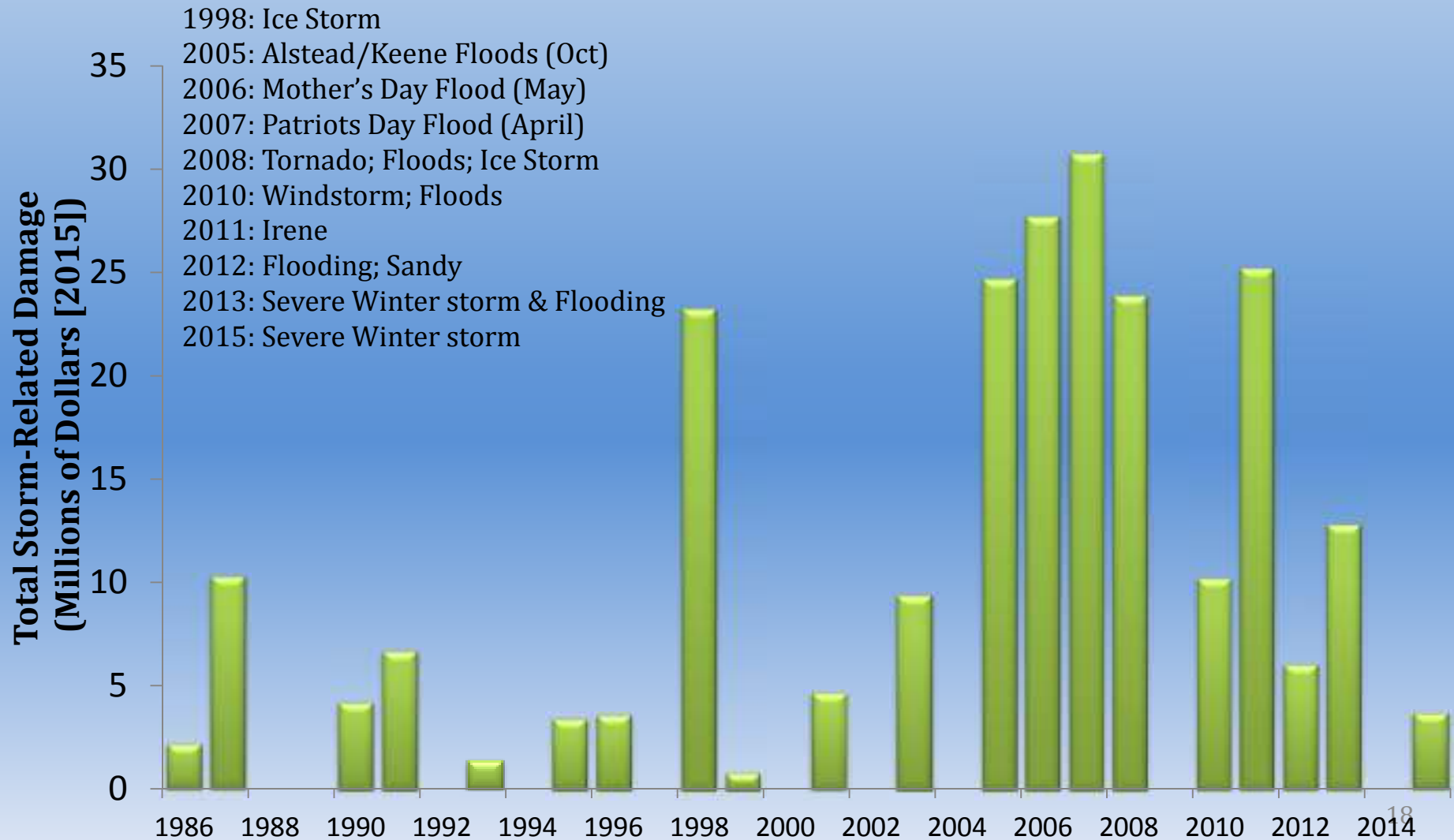
Presidentially-Declared Storm-Related Disasters

- 1951-2000 (**50 Years**)
 - 14 Declared Disasters
- 2001-2015 (**15 Years**)
 - 18 Declared Disasters
 - 1 Hurricane
 - 1 Tropical Storm
 - 13 Severe Storms
 - 1 Fall Snow Storm
 - 3 Winter Storms



Axe Handle Brook, Rochester, NH, May 2006

Federal Disasters Expenditures in New Hampshire



Tropical Storm Irene in Vermont: A Glimpse of What Might Have Been

- 225 of 250 VT municipalities were impacted.
- State office complex shut down

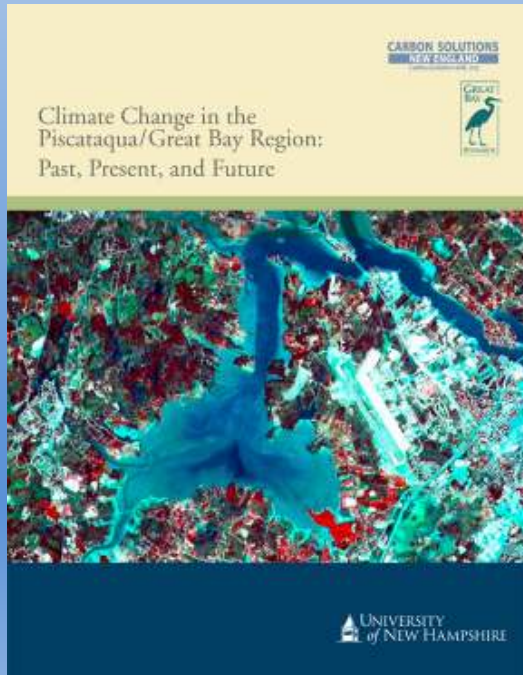


Tropical Storm Irene in Vermont: A Glimpse of What Might Have Been

- 500 miles of state roadway and 2000 local road segments destroyed
- 1,000 culverts and 280 bridges damaged or destroyed.



Local & Regional Climate Assessments



Seacoast



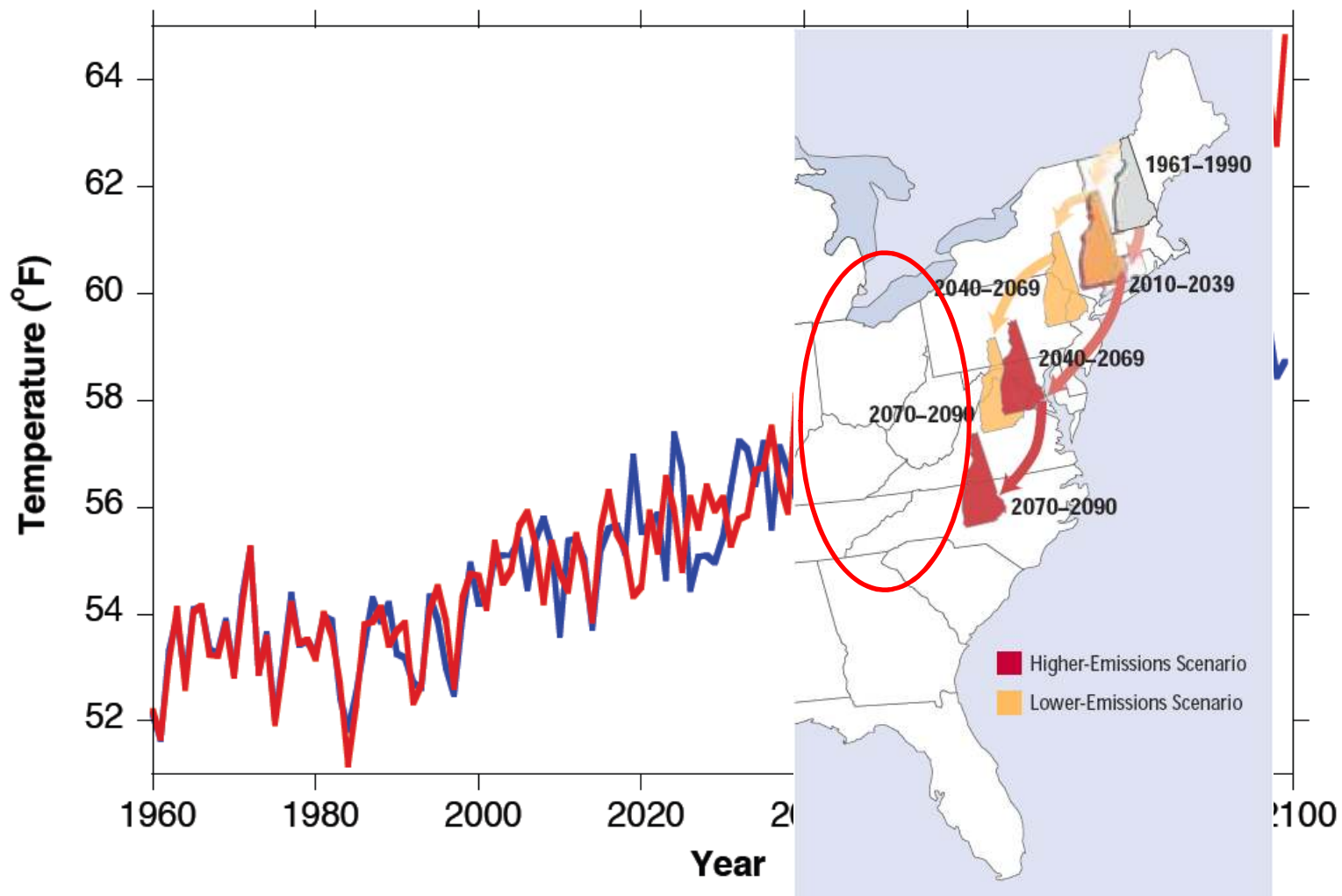
Southern NH



Northern NH

***New Hampshire is considered a leader
in New England!***

Projected Annual Maximum Temperature Northern New Hampshire



Mitigation

- Purchase efficient fleet and personal vehicles



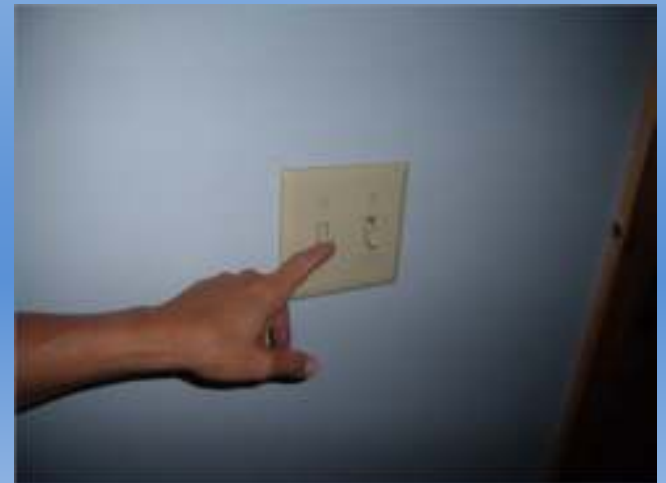
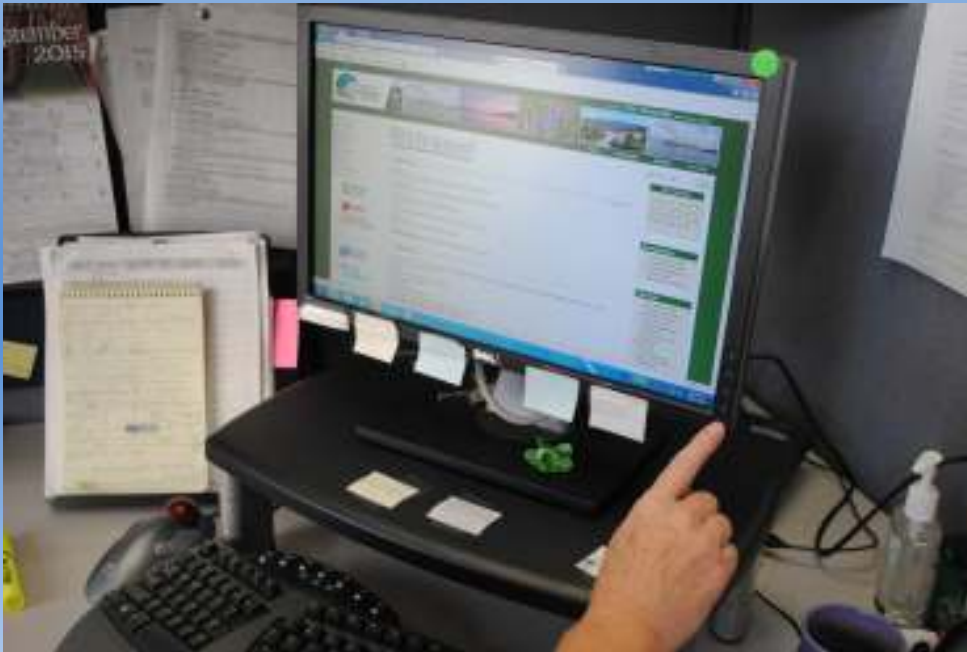
Mitigation

- Make our buildings and homes more efficient and utilize alternative energy



Mitigation

- Turning off lights and office equipment



Mitigation

- Use water efficiently
- Waste less food



Adaptation is Key in Planning for Climate Change

We have four adaptation options:

1. Take no action or “business as usual” scenario



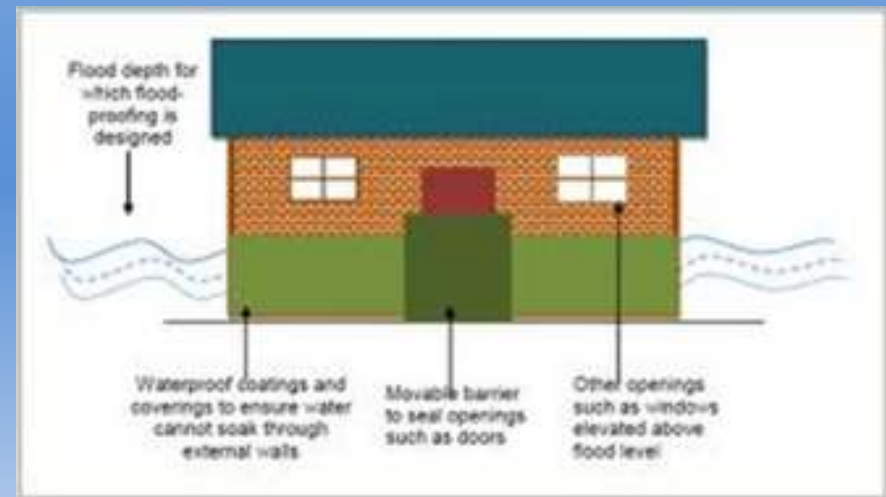
Adaptation

2. “Protect and fortify” built infrastructure



Adaptation

3. “Accommodate” using natural systems and alternative construction techniques and materials, site design.



Adaptation

4. “Retreat” by relocating or removing built infrastructure from highly vulnerable areas and those damaged repeatedly



Investments in Adaptation

It's not a question of **IF** we'll pay to adapt

It's a question of **WHEN** we'll pay

We can plan ahead & get
where we want to go

We can incur damages, clean up
the mess & live with the consequences

Anticipatory Adaptation

River & Stream buffers

Help to Decrease :

- storm water runoff
- erosion
- flooding

OR

\$1.00

\$4.00

Reactionary Adaptation



Already Adapting - “Yankee Ingenuity”

- Power companies trimming trees and limbs
- Maintaining & upgrading culverts when replacing
- On-going road/drainage maintenance
- Backup generators



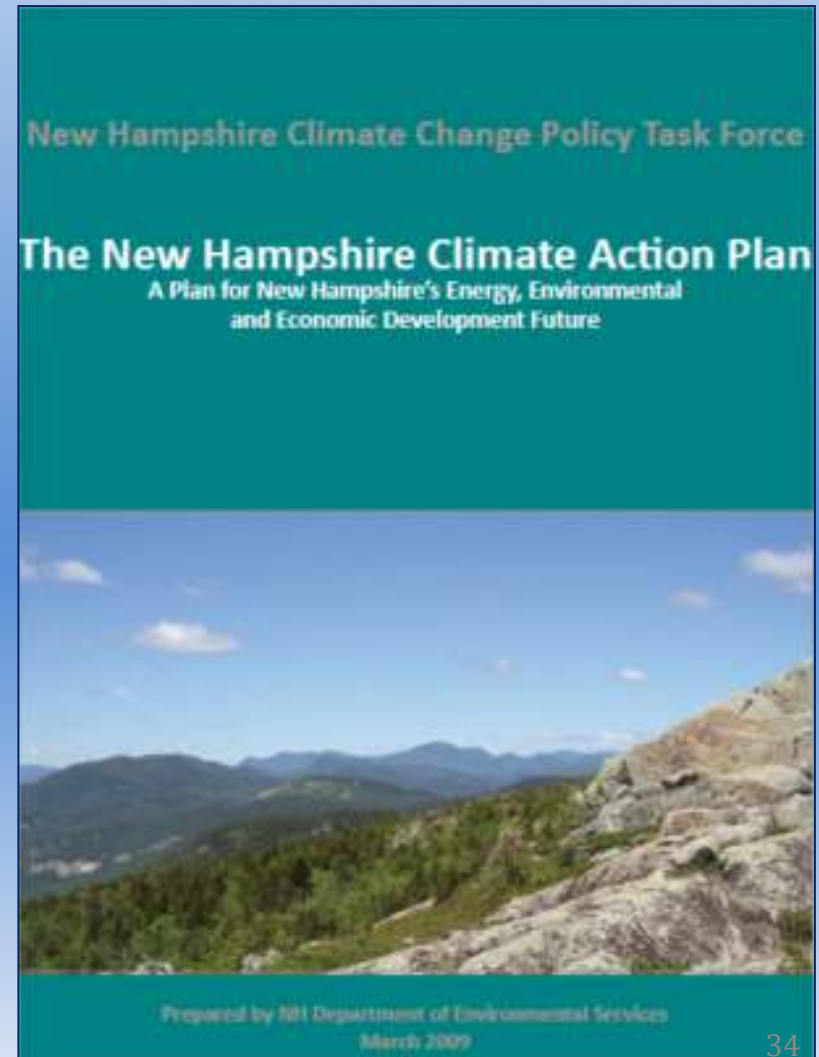
Planning in the Face of Uncertainty

- Winters
 - Lots of road salt one year; No winter another year
 - Rain on snow events lead to flooding
- Summers
 - Longer mowing season
 - Extra care for field staff
 - Cyanobacteria blooms
 - Reduced water availability
- Sometimes flooding
- Sometimes drought



NH Climate Action Plan

- 5th Anniversary
- 67 Recommendations
- Addresses the causes and the impacts of climate change
- Developed by NH for NH
- The Plan is in the People, not the Pages



Regional Resiliency and Preparedness Efforts

- Regional Workgroups
 - Coastal Adaptation Workgroup
 - Established in 2010
 - Upper Valley Adaptation Workgroup
 - Established in 2012
- Legislative
 - Coastal Risks and Hazards Commission
 - Established in 2013



NH State Agencies Working Together



NH State Agencies Working Together



What Should State Agencies Be Doing?

- Build on existing frameworks in agencies & the state-wide COOPs
- Conduct vulnerability assessments to identify risks
- Collaborate as state agencies
 - Align agency's responsibilities with those of other agencies
- Learn from our New England neighbors
- **Reduce fossil fuel consumption**



We Have Met Environmental Challenges in the Past!

- 40 years ago – Smog
 - Solution: Catalytic converters
 - Smog reduced by 30% to 50%



We Have Met Environmental Challenges in the Past!

- 35 years ago – Ozone layer destruction
 - Solution: Chlorofluorocarbon (CFC) phase out
 - CFCs all but eliminated, ozone layer (slowly) rebounding



We Have Met Environmental Challenges in the Past!

- 30 years ago – Acid Rain
 - Solution: market-based program for regulating utility sulfur dioxide emissions
 - Acid rain emissions cut by 50%; forests rebounding, lakes (slowly) rebounding



Questions?

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